

# A new species of *Steganacarus* (Acari, Cryptostigmata) from Israel

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## Introduction

In connection with a computer study of phenetic affinity within the Phthiracaroida, Sheals (1969) examined a small collection of phthiracarid mites collected by Dr M. Costa from bay litter (*Laurus nobilis*) in Upper Galilee, Israel. The material was found to contain several specimens of an undescribed and very distinctive species of the genus *Steganacarus* Ewing, characterized by the presence of an anterodorsal notogastral pouch. A series of scanning electron micrographs published later by Griffiths & Sheals (1971) illustrated certain aspects of the external morphology of this mite, a description of which is given below.

Family PHTHIRACARIDAE Perty, 1841

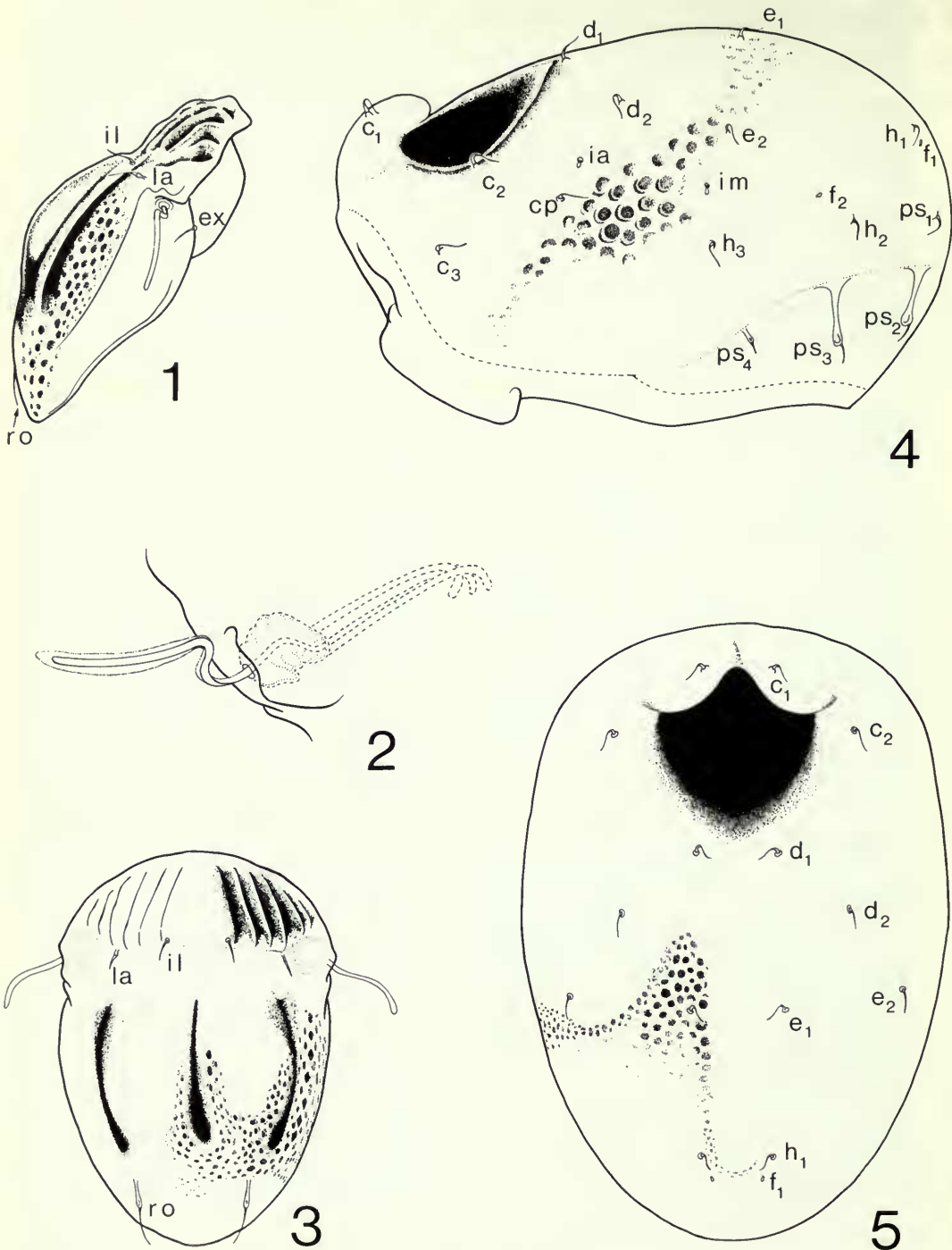
*Steganacarus sacculiferus* sp. nov.

*Aspis* (Figs 1–3): 242–463  $\mu\text{m}$  long and with a greatest width of 206–370  $\mu\text{m}$ . All the dorsal setae are fine, short and procumbent. The interlamellar (*il*) and lamellar setae (*la*) are more or less equal in length and form a transverse row behind which the prodorsal integument is raised into a number of longitudinal ridges. The sensillus is membranous, blunt distally and cranked near the base. Three finger-like tracheoles can be discerned below the bothridium and there is a single pair of short exobothridial setae (*ex*). In front of the *il*–*la* row there is a pronounced median keel and a pair of lateral keels. There is a distinct lateral ridge and a pronounced scale behind the bothridium. The aspal rim and the margins of the bothridial apertures are thickened. The integument is coarsely pitted around the bases of the keels and over the rostrum, but elsewhere it is finely punctate.

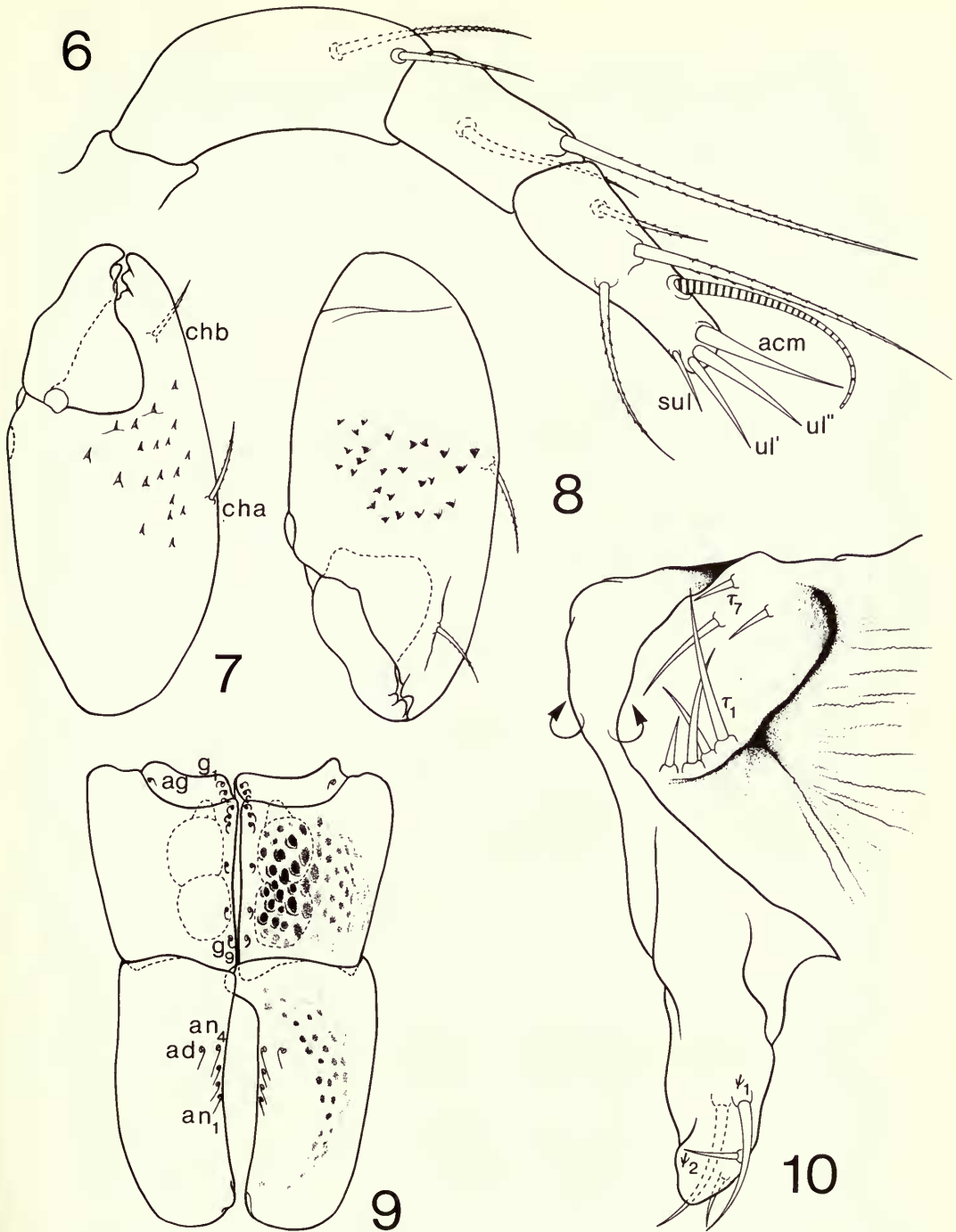
*Notogaster* (Figs 4 & 5; Pl. 1A & C): 535–1800  $\mu\text{m}$  in length along a line through  $c_1$  to  $h_1$ , and with a greatest depth of 329–741  $\mu\text{m}$ . All the setae are short (less than the distance  $c_1$ – $d_1$ ), recurved and finely serrated (Pl. 1C). Vestigial  $f_1$  is located just below  $h_1$ . The deep pouch located anterodorsally (generally filled with detritus) is partially overhung by a bilobed cowl which originates from the anterior limit of the notogaster and bears setae ( $c_1$ ) paraxially (Pl. 1A). The notogastral integument is coarsely pitted posterolaterally, while anteriorly, and mid-dorsally in the area bounded by setae ( $e_1$ ) and ( $h_1$ ), the notogaster has no distinct ornamentation.

*Ano-genital region* (Figs 9 & 10; Pl. 1D): There are four pairs of marginal anal setae ( $an_{1-4}$ ) and a single pair of adanal setae (*ad*) located submarginally. The genital setae ( $g_{1-9}$ ) are minute and arranged in a pattern of 6+3 along the paraxial margins of the genital plates. A single aggenital seta *ag* is located antiaxially in the genital furrow. The integument of the anal and genital plates is distinctly pitted with the exception of the finely punctate setal-bearing areas. There are three pairs of genital papillae, the two anterior pairs bordering the ovipositor. The latter is trilobed. The ventral lobe is triangular in anterior view (Pl. 1D) and bears two pairs of setae distally ( $\psi_{1-2}$ ), while the two laterodorsal lobes (indicated by the arrows in Fig. 10) are larger, compressed laterally and each bear seven setae ( $\tau_{1-7}$ ) antiaxially. The surfaces of the laterodorsal lobes are finely striated.

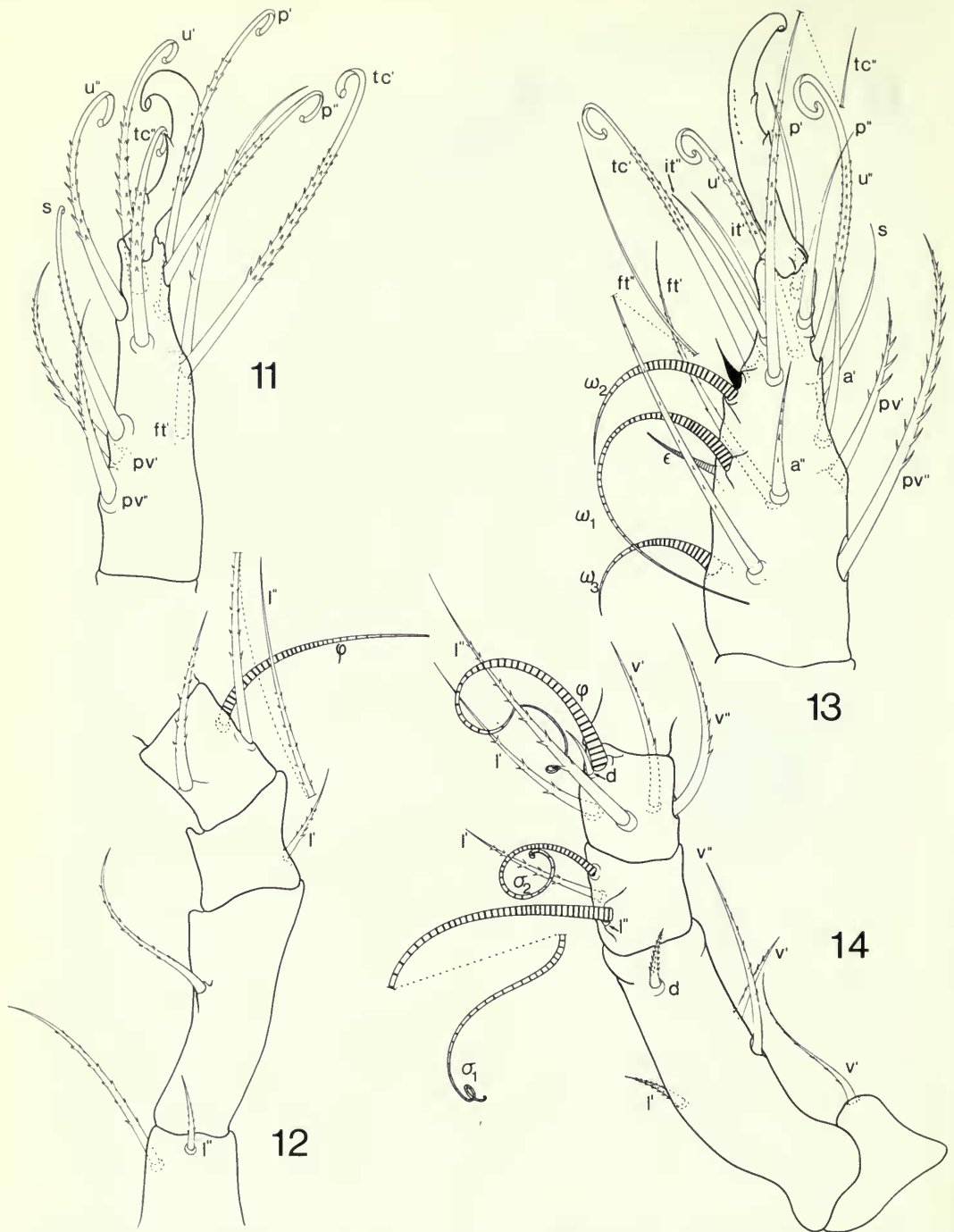
*Infracapitulum*: This is typically phthiracaroid in form (see for example, Macfarlane & Sheals, 1965). There are three pairs of adoral setae, the anterior pair being brush-like distally and the posterior two pairs weakly serrated.



Figs 1-5 *Steganacarus sacculiferus*: (1) aspis, lateral; (2) sensillus and bothridium; (3) aspis, dorsal; (4) notogaster, lateral; (5) notogaster, dorsal.



**Figs 6-10** *Steganacarus sacculiferus*: (6) pedipalp; (7) chelicera, paraxial; (8) chelicera, antiaxial; (9) ano-genital region; (10) ovipositor, lateral.



Figs 11 & 12 *Steganacarus sacculiferus*, posterolateral aspect of leg IV: (11) tarsus; (12) tibia to trochanter.

Figs 13 & 14 *Steganacarus sacculiferus*, posterolateral aspect of leg I: (13) tarsus; (14) tibia to trochanter.

(Figs 11 and 13 are drawn at the same magnification.)

*Pedipalps* (Fig. 6): Three-segmented with the setal formula (2-2-7). Four of the tarsal setae (*acm*, *ul''*, *ul'* and *sul*) are eupathidial, *sul* being rather short (this seta is a minute spine-like process in species of *Hoplophthiracarus* and *Phthiracarus*).

*Chelicerae* (Figs 7 & 8): Both the fixed and the movable digits have two distinct teeth. The principal segment carries 17-29 conical spines on the antiaxial surface and 13-20 sharply pointed spines on the paraxial surface. This arrangement of cheliceral spines has also been observed in species of *Phthiracarus* but here the greatest number of spines is carried on the paraxial surface. Setae *cha* and *chb* are both serrated, *cha* being somewhat longer than *chb*. The latter is inserted on the antiaxial surface while *cha* is located dorsally. The cheliceral integument is punctate.

*Legs* (Figs 11-14; Pl. 1B, E & F): Legs II-IV are approximately equal in length while leg I is longer and more robust. The solenidial formulae for the legs are I (2-1-3); II (1-1-2); III (0-1-1) and IV (0-1-0). All the solenidia are long, usually with one or two coils distally. Solenidion  $\omega_2$  on tarsus I is coupled with a small distal seta (Pl. 1E). Such a setal/solenidial association was first described in *Hoplophthiracarus* (Macfarlane & Sheals, 1965) but has since been observed in a number of other phthiracaroid genera including *Neophthiracarus* (Sheals & Macfarlane, 1966), *Steganacarus* (Griffiths & Sheals, 1971) and *Phthiracarus* (Harding, 1976). The solenidion  $\phi$  on tibia IV is free while on tibiae I-III it is closely associated with a dorsal seta *d*. The latter is comparatively long and rather prominent on tibia I but is much shorter on tibiae II and III. Solenidion  $\sigma_1$  is coupled proximally with a minute lateral seta *l''* on genu I (Pl. 1F). The formulae for the leg setae are as follows: I (1-4-2-5-16-1); II (1-3-2-3-12-1); III (2-2-1-2-10-1) and IV (2-1-1-2-10-1). The famulus  $\epsilon$  is short, rugose and closely associated with  $\omega_1$ . Six of the setae on tarsus I (*it*), (*p*), *s* and *a'*) are eupathidial. Seta *tc''* is comparatively long and straight (this seta is hooked in species of *Phthiracarus*). On all four tarsi setae (*ft*) and (*pv*) (together with *a''* on tarsi I and II) are more or less straight, circular in section and bear two or three rows of lateral serrations. The other tarsal setae (*tc'* and (*u*) on tarsus I and (*tc*), (*u*), (*p*) and *s* on tarsi II-IV) are ribbon-like, hooked distally and covered with whorls of spicules in the middle third (Pl. 1B). Seta *d* on femora I-III and seta *l''* on femur I are somewhat thickened and densely serrated. On all segments the lateral setae (*l*) bear several whorls of spicules in the middle third while the ventral setae (*v*) carry only two or three rows of serrations. All the tarsi terminate in a single claw bearing two ventral teeth and a row of serrations antero- and posterolaterally.

**MATERIAL:** Holotype, BMNH reg. no. 1977.2.11.1, and four paratypes, BMNH reg. no. 1977.2.11.2-5, all adults, from bay litter (*Laurus nobilis*), Upper Galilee, Israel. The material was collected by Dr M. Costa, 4 November 1968.

**REMARKS:** On the results of his study, Sheals (1969) suggested that certain species of *Steganacarus* (including *S. sacculiferus*, his number 17) might be classified with *Tropacarus* species to form a group all the members of which have 30 notogastral setae and an uncoupled solenidion on tibia IV. *S. sacculiferus* is unique amongst the known members of this 'grouping' by virtue of its large pouch located anteriorly on the dorsum of the notogaster. The anterior cowl, although reminiscent of that found in *Tropacarus pulcherrimus* (Berlese), is also unique in that its posterior margin is deeply divided. Moreover, although *S. sacculiferus* shows an overall similarity to *Steganacarus*, it has certain affinities with *Tropacarus*.

Species currently classified in *Tropacarus* Ewing are distinguished from those of *Steganacarus* by the presence of a narrow band of unsculptured notogastral integument extending mid-dorsally from the level of seta  $c_1$  to seta  $ps_1$ . This band may be elevated to form a carina along the whole of its length as in *Tropacarus carinatus* (C. L. Koch) or the carina may be only developed posteriorly as in *Tropacarus brevopilus* (Berlese). The area of unsculptured integument mid-dorsally in *S. sacculiferus* (extending from the anterior limit of the notogaster to seta  $h_1$ ) resembles that found in *Tropacarus*. Moreover, the genital setae of *S. sacculiferus* are in a pattern of 6+3 as in *Tropacarus* species, while the 5+4 arrangement is found in *Steganacarus*. The notogastral setae are comparatively short as in *Tropacarus* (for example, *T. carinatus*) but the general shape of the notogaster and the form of the integumental ornamentation are characteristic of *Steganacarus* species.

## References

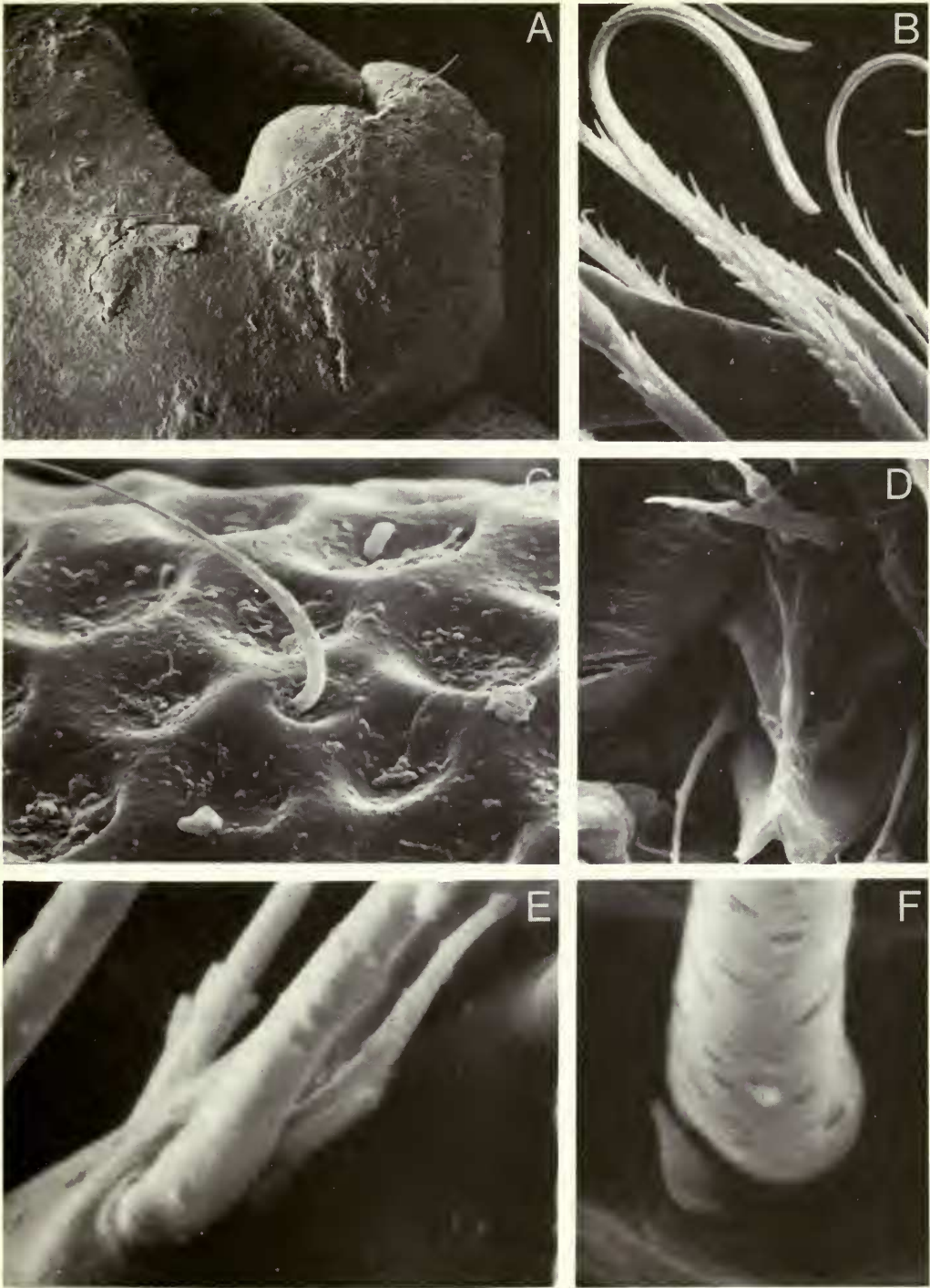
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- & Macfarlane, D. 1966. A new species of *Neophthiracarus* (Acari : Phthiracaridae) from Tierra del Fuego. *Ann. Mag. nat. Hist.* (13) **9** : 233-237.

## Addendum

Since this manuscript went to press a paper by Mahunka has been published (30 September 1977) in which he describes *Steganacarus grandjeani* as a new species from Galilee, Israel. *S. grandjeani* is undoubtedly synonymous with *S. sacculiferus* and must therefore receive priority.

## Reference

- Mahunka, S. 1977. Neue und interessante Milben aus dem Genfer Museum XXVIII. Zwei neue Oribatiden-Arten (Acari) aus Israel. *Acarologia* **19** : 132-135.



**Plate 1** Scanning electron micrographs of *Steganacarus sacculiferus*: (A) notogastral pouch, latero-dorsal aspect,  $\times 200$ ; (B) unguinal seta on tarsus II,  $\times 1600$ ; (C) detail of notogastral integument and seta, posterolateral aspect,  $\times 1300$ ; (D) ventral lobe of ovipositor, anterior aspect,  $\times 1000$ ; (E) distal solenidion and associated seta on tarsus I, posterolateral aspect,  $\times 6000$ ; (F) solenidion and associated seta on genu I, dorsal aspect,  $\times 6000$ .

